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PATENT ABSTRACTS OF JAPAN

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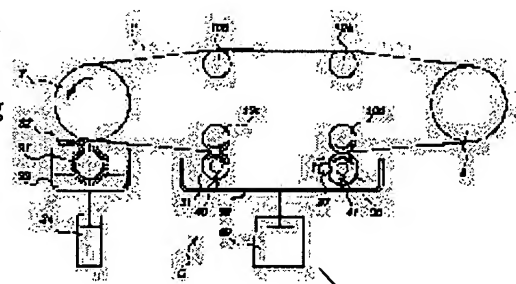
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(54) INK JET PRINTER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ink jet printer that comprises a wiping roller for readily absorbing residual water on an endless belt and not attaching dust to the endless belt, and dispenses with periodic replacing of the wiping roller.

SOLUTION: This ink jet printer comprises a conveying section having an endless belt 9 for supporting and conveying a printing medium and a driving means for driving the endless belt 9, a printing section for performing printing on the printing medium conveyed by the endless belt 9, a collecting section for separating and collecting the printed printing medium which is conveyed from the printing section by the endless belt 9 and a cleaning section C for cleaning the endless belt 9 from which the printing medium is removed at the collecting section. The cleaning section C comprises a wiping roller 36 of which at least the circumferential face is made of a high polymer porous material.



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CLAIMS

[Claim(s)]

[Claim 1] An ink jet printing equipment which is characterized by providing the following and which prints on print data medium by breathing out ink from this ink jet arm head using an ink jet arm head The conveyance section equipped with a driving means which makes an endless belt which performs support and conveyance of said print data medium, and this endless belt drive The print section which performs a print by said ink jet arm head to said print data medium conveyed with said endless belt A stripping section which separates from said endless belt said print data medium [finishing / a print conveyed with said endless belt], and collects it from said print section It is the wiping roller with which it has the washing section which washes said endless belt with which said print data medium was removed in said stripping section, and, as for said washing section, a peripheral surface consists of a macromolecule porosity object at least further.

[Claim 2] Said washing section is an ink jet printing equipment according to claim 1 characterized by having further a brush for washing said endless belt, and a mangle roller for removing waterdrop, and said wiping roller removing moisture which remained on the occasion of waterdrop clearance with said mangle roller.

[Claim 3] An ink jet printing equipment according to claim 1 or 2 characterized by having further a squeezing roller which carried out the pressure welding to said wiping roller.

[Claim 4] Said stripping section is an ink jet printing equipment given in claim 1 characterized by consisting of a means which exfoliates and rolls round said print data medium from said endless belt thru/or any 1 term of 3.

[Claim 5] Said ink jet arm head is an ink jet printing equipment given in claim 1 characterized by having an electric thermal-conversion object which makes ink produce a change of state accompanied by a steep volume change by heater element which generates heat by receiving an electrical signal as an energy generation means for carrying out the regurgitation of the ink thru/or any 1 term of 4.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the ink jet printing equipment which prints especially by breathing out ink on cloth etc. about the printing equipment which outputs input image information to print data medium.

[0002] Moreover, this invention is invention applicable to the equipment which records to print data medium, such as paper, thread, fiber, a textile, leather, a metal, plastics, glass, wood, and ceramics, and the industrial recording device complexly combined with various processors.

[0003] In addition, "print" and "record" in this invention mean it not only giving an image with the semantics of an alphabetic character, a graphic form, etc. to a record medium-ed, but giving an image without semantics of a pattern etc.

[0004]

[Description of the Prior Art] The ink jet record method of making ink producing the change of state accompanied by a steep volume change (generating of air bubbles), adhering ink to discharge from a delivery, making this adhering on a record medium-ed according to the applied force based on this change of state, and performing image formation by giving energy, such as heat, to ink, and the so-called bubble jet record method are learned conventionally. Generally the electric thermal-conversion object as an energy generation means for carrying out the regurgitation of the ink arranged in the delivery for carrying out the regurgitation of the ink, the ink passage which is open for free passage to this delivery, and ink passage is arranged on the recording device using this bubble jet record method as indicated by official reports, such as U.S. Pat. No. 4,723,129.

[0005] According to such a record method, with the arm head which performs this record method, while the high image of grace is recordable in a high speed and the low noise, since the delivery for carrying out the regurgitation of the ink can be arranged to high density, it has the point that the record image of high resolution and many that a color picture can also be obtained further easily were excellent in small equipment. For this reason, this bubble jet record method is used for many office devices, such as a printer, a copying machine, and facsimile, and is further used even for industrial systems, such as textile-printing equipment, increasingly in recent years.

[0006] By the way, in the ink jet printing equipment which prints by giving ink to a textile etc. from an ink jet arm head, adhesion immobilization is carried out and a textile is conveyed by the endless belt. Furthermore, ink is given from an ink jet arm head to the textile conveyed and positioned to a position. However, when giving ink even to the edge of a textile, ink will adhere also to the surface on which the endless belt contiguous to this edge was exposed. Moreover, if ink is given, ink will pass a textile and the field (endless belt side) which touches the endless belt which is the background of the field (print side) which receives grant of ink will also be polluted with a thin textile in ink. Moreover, if the dust adhering to a textile, fluff, fiber, etc. adhere to an endless belt and deposit, the adhesion stability to the endless belt of a textile will deteriorate.

[0007] Therefore, after dropping the dust from dirt and the textile of ink, and fluff on a washing brush after exfoliating a textile from an endless belt, and draining off water with a mangle roller, while wiping off the residual moisture of an endless belt side with a wiping roller and maintaining an endless belt at cleaning, the adhesiveness of an endless belt is revived.

[0008] Conventionally, the core which becomes this wiping roller from a metallic material, and the thing which twisted cloth etc. around that periphery were used.

[0009] An example of the conventional example is shown in drawing 5. This drawing is a cross section which met the center line (the inside of drawing, VI-VI' line) of the conventional wiping roller. a wiping roller -- cloth 51 is twisted

around the peripheral face of a core 50.

[0010]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional example, for the wiping roller with which cloth was twisted, it wipes off and the technical problem which the adhesiveness of the textile to an endless belt worsened, therefore the absorptivity of moisture is not only bad, but was included for moisture with the residual moisture which remains in the endless belt since there are also few absorbed amounts and which should be solved that rollers must be exchanged periodically occurs. Moreover, since the periphery section of a wiping roller is cloth, it wipes off to the endless belt which carried out clarification, and the technical problem which should be solved that fiber waste and the fluff of a roller adhere also occurs.

[0011] Therefore, this invention solves the above-mentioned technical problem, and it has the wiping roller which does not make excessive dust or excessive fluff adhere to an endless belt while making the residual moisture of an endless belt easy to absorb, and the means containing moisture which wipes off and extracts a roller, and aims at offering an ink jet printing equipment without the necessity of exchanging a wiping roller periodically.

[0012]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, an ink jet printing equipment based on this invention It is the ink jet printing equipment which prints on print data medium by breathing out ink from this ink jet arm head using an ink jet arm head. The conveyance section equipped with a driving means which makes an endless belt which performs support and conveyance of print data medium, and this endless belt drive, The print section which performs a print by ink jet arm head to print data medium conveyed with an endless belt, A stripping section which separates from an endless belt print data medium [finishing / a print] conveyed with an endless belt, and collects it from the print section, It has the washing section which washes said endless belt with which print data medium was removed in a stripping section, and the washing section is further characterized by providing a wiping roller with which a peripheral surface consists of a macromolecule porosity object at least.

[0013] Preferably, the washing section is further equipped with a brush for washing an endless belt, and a mangle roller for removing waterdrop, and a wiping roller removes moisture which remained on the occasion of waterdrop removal with a mangle roller.

[0014] Preferably, it has further a squeezing roller which carried out the pressure welding to a wiping roller.

[0015] Preferably, a stripping section consists of a means which exfoliates and rolls round print data medium from an endless belt.

[0016] Preferably, an ink jet arm head is equipped with an electric thermal-conversion object which makes ink produce a change of state accompanied by a steep volume change by heater element which generates heat by receiving an electrical signal as an energy generation means for carrying out the regurgitation of the ink.

[0017]

[Embodiment of the Invention] The example of 1 operation gestalt of the ink jet printing equipment of this invention is explained referring to drawing.

[0018] Drawing 1 is the cross section showing the rough configuration of the ink jet printing equipment concerning this invention.

[0019] A reference mark 1 is a textile as print data medium, ***** B **** this textile 1 here, and it begins to be wound according to rotation of a roller 2. After being substantially conveyed horizontally by the conveyance section A prepared in the part which counters the record means 4 through roller 3a, dust-removing rollerb [3] and 3c, and wrinkle picking roller 3d and Laura Nakama 3e and 3f, it rolls round through Laura Nakama 3g and 3h, and is rolled round by the roller 5.

[0020] the conveyance section A -- a servo motor 6 -- connecting -- a drive -- it builds over an endless belt 9 between the pivotable driving roller 7 and the follower roller 8 which can be rotated, and by carrying out drive rotation of the driving roller 7, an endless belt 9 is rotated to the counterclockwise rotation of drawing 1 , and a textile 1 is conveyed. The adhesive layer is formed in the surface of this endless belt 9. And the textile 1 which it ****(ed) and let out from the roller 2 pushes and pastes the adhesive layer of an endless belt 9 with the pasting roller 14, and it is conveyed, without floating from an endless belt 9.

[0021] In addition, in the record means 4 and the predetermined range which counters, an endless belt 9 is guided by platen rollers 10a and 10b, and it is constituted so that the suitable tension for the belt 9 in the portion may be given and a textile 1 may be conveyed horizontally.

[0022] The ink jet recording method which breathes out and records ink from a recording head is used for the record means 4.

[0023] In addition, it is prepared in the record means 4 so that carriage 4a can move in the direction perpendicular to the

space of drawing 1 , and a print is carried out to it by two ink jet head 4b attached between this migration at carriage 4a. [0024] Although a print agent is given by the record means 4 in the field between platen roller 10a and 10b, the textile 1 conveyed where surface smoothness is secured such exfoliates from the conveyance belt 9 thru/or a glue line in the part of a driving roller 7 and it is rolled round with the rolling-up roller 5, desiccation processing is performed to the middle by the drying heater 12. Especially this drying heater 12 is effective when using a liquid as a print agent. In addition, the thing of proper gestalten, such as what sprays warm air to a textile 1 as a drying heater 12, and a thing which irradiates infrared radiation, can be used. Moreover, the HS station 11 for performing concentration unevenness amendment of ink jet head 4b is established in the location which can slide the record means 4.

[0025] In the above-mentioned configuration, it **** and the roller 2, the rolling-up roller 5, the driving roller 7, and the follower roller 8 grade are supported with the stand 15 made into one by the welded construction of the frame which is the structure of the main part of textile-printing equipment. The level putt 16 which enables adjustment of equipment in a horizontal and the height direction to an installation floor line is attached in two or more predetermined parts of a stand 15.

[0026] Moreover, the record means 4 is established movable horizontally and, thereby, can raise operability, such as a maintenance of belt exchange etc.

[0027] It **** and the tension is applied to hard flow with the non-illustrated clutch etc. with a roller 2 being ****(ed). Thereby, a wrinkle is lengthened by wrinkle picking roller 3d, without sag occurring in a textile 1.

[0028] As for the rolling-up roller 5, the tension is applied in the rolling-up direction with the non-illustrated clutch etc. If a belt 9 is sent and a tension becomes weak by this, a textile 1 will be rolled round by the rolling-up roller 5 while a textile 1 is removed from a belt.

[0029] After a textile 1 exfoliates, as for a belt 9, a surroundings lump and the washing section C are passed caudad. The concrete configuration of this washing section C is shown in drawing 2 .

[0030] In the washing section C, the ink adhering to the belt surface, the dust adhering to an adhesive layer, and fluff are washed by the washing brush 31. A spray nozzle 32 is formed between the washing brush 31 and a belt 9, and it is washed, supplying water. Rise and fall of the washing brush 31 are attained in the cylinder 34 with the water saucer 33. As for the water saucer 33, water accumulates until the lower part of the washing brush 31 is under water. Thereby, the fiber waste adhering to the washing brush 31, dust, and fluff are washed out.

[0031] Waterdrop has adhered to the surface of the belt 9 rinsed with the washing brush 31. A spring 40 pushes [lower platen roller 10c and the mangle roller 35] the waterdrop, and it removes by putting and carrying out the pressure welding of the belt 9 by **. big thereby -- waterdrop -- although removed, residual moisture remains in the surface of a belt 9. This is wiped off and a roller 36 removes.

[0032] The wiping roller 36 is made from the porosity object which consists of polymeric materials, such as urethane, and detailed pore is formed. This is not only excellent in absorptivity, but has flexibility. therefore, the surface of a belt 9 -- residual moisture can be wiped off, without making excessive dust and fluff adhere.

[0033] However, if residual moisture is absorbed continuously, ***** water capacity will be reached soon and residual moisture will not be absorbed. By pressing out the moisture which the wiping roller 36 absorbed, it is a squeezing roller 37 to revive the absorptivity of the wiping roller 36.

[0034] The physical relationship of the wiping roller 36 and a squeezing roller 37 is shown in drawing 3 .

[0035] A squeezing roller 37 consists of a metal material, and it is attached so that a pressure welding may be carried out to the wiping roller 36. The installation pitch P is attached in the pitch smaller than the sum of the radius R1 of the wiping roller 36, and the radius R2 of a squeezing roller 37. That is, the squeezing roller 37 which consists of a metallic material is attached so that it may eat into the wiping roller 36 with flexibility. Although wiping roller 36 the very thing does not have a driving source, since adhesiveness is shown in the surface of a belt 9, it wipes off with migration of a belt 9 and a roller 36 rotates. Moreover, a squeezing roller 37 will not have a driving source, and since a pressure welding is carried out to the wiping roller 36 and it is attached, if the wiping roller 36 rotates, a squeezing roller 37 will also rotate. Although the surface of the wiping roller 36 is absorbing moisture, since it wipes off with the squeezing roller 37 attached by carrying out a pressure welding and the surface of a roller 36 is pushed, the moisture of the surface of the wiping roller 36 is pressed out.

[0036] Drawing 4 is drawing showing installation of the wiping roller 36 and a squeezing roller 37, (a) is a side elevation and (b) is front view. The wiping roller 36 is supported by the bearing 43 attached in the plate 42 so that it may be pivotable. The squeezing roller 37 is supported by the bearing 46 fixed to the bearing holder 45 with the snap ring 47 so that it may be pivotable. The slot is prepared so that a plate 42 can slide the bearing electrode holder 45. When carrying out the pressure welding of the squeezing roller 37 to the wiping roller 36, with the push screw 48, the bearing electrode holder 45 wipes off, it is brought near by the roller 36 side, this wipes off, and the pressure welding of

the squeezing roller 37 is carried out to a roller 36.

[0037] One pair of component part of these plate 42 grade is prepared in the wiping roller 36 and squeezing roller 37 each axial both ends. Moreover, a plate 42 is pushed up to lower platen roller 10d by the compression spring 41, as it puts a belt 9, it wipes it off, and a roller 36 carries out a pressure welding to a belt 9. Thereby, it can wipe off also with few residual moisture which adhered on the surface of a belt 9.

[0038] Therefore, since the ink jet printing equipment of this example of an operation gestalt is equipped with the wiping roller for removing residual moisture and a wiping roller consists of a porosity object which consists of polymeric materials, excessive dust or excessive fluff cannot be made to be able to adhere to an endless belt, but the residual moisture of an endless belt can be absorbed. Moreover, since the squeezing roller is formed free [rotation] as a pressure welding is carried out to a wiping roller, periodical exchange of a wiping roller can be made unnecessary.

[0039]

[Effect of the Invention] As explained above, since it constituted like ****, the ink jet printing equipment based on this invention can make the maintenance of wiping roller exchange unnecessary always purely [belt / endless] while being able to maintain the adhesion of the adhesive layer of the endless belt surface.

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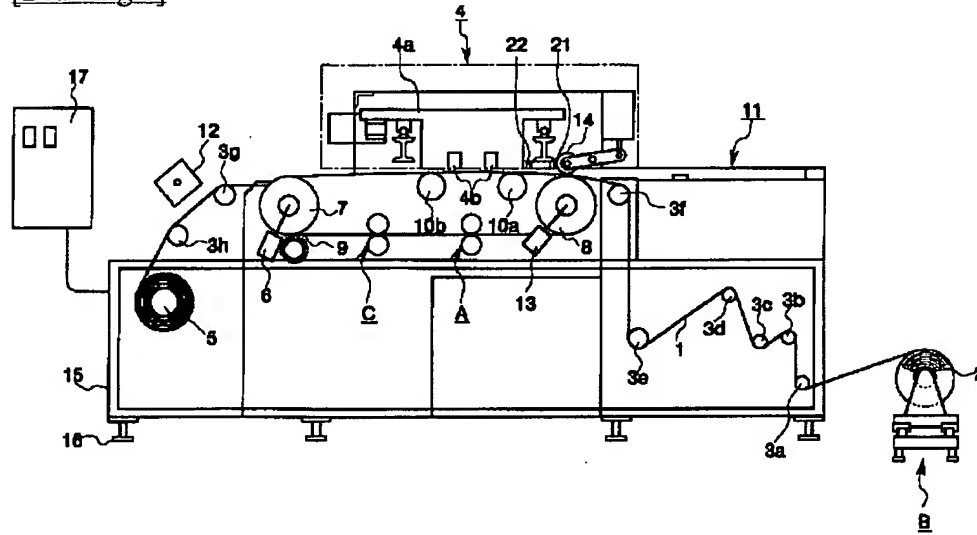
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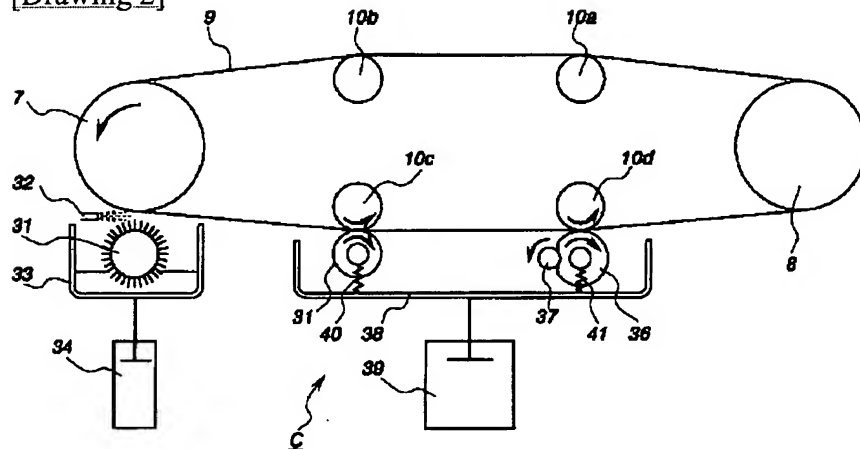
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DRAWINGS

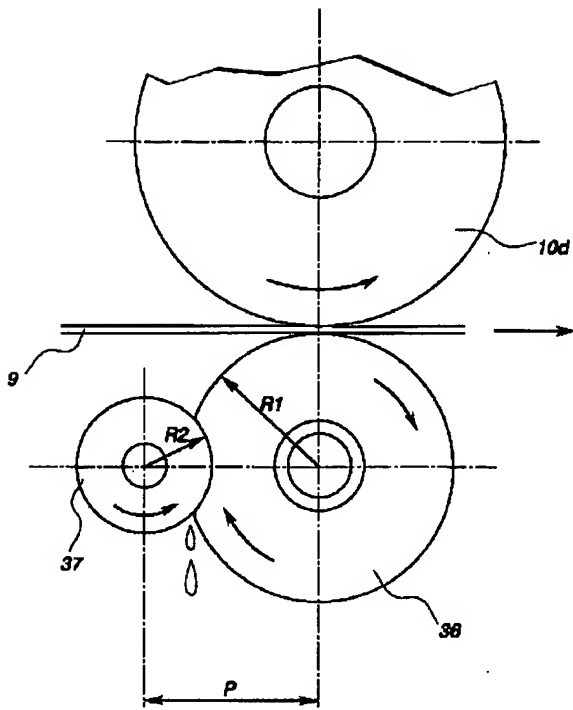
[Drawing 1]



[Drawing 2]

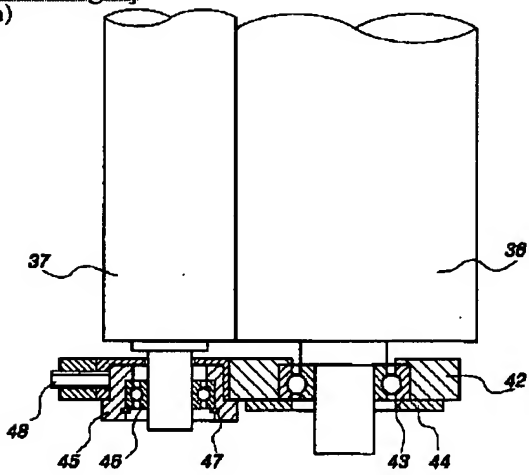


[Drawing 3]

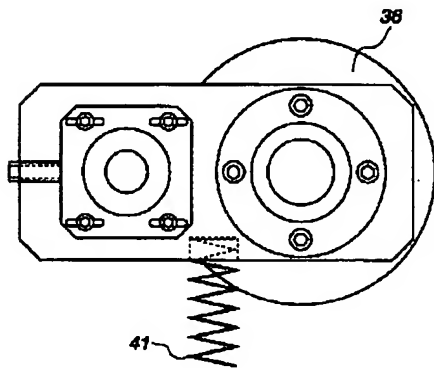


[Drawing 4]

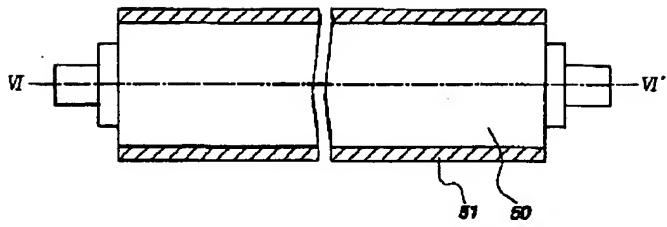
(a)



(b)



[Drawing 5]



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